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July 18, 1994

JUL 18 1994

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Re: Notice of Ex Parte Contact PP Docket No. 93-253

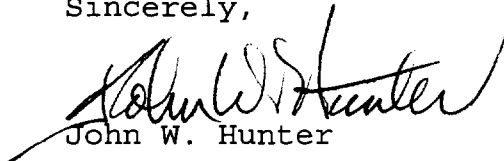
Dear Mr. Caton:

Pursuant to Section 1.1206 of the Commission's Rules, notice is hereby given of an ex parte communication regarding the above-referenced proceeding. The instant notice is being submitted in duplicate.

Another series of E-mail communications concerning bid increments and bidding activity for the narrowband PCS auctions have been sent to a member of the Commission's staff. Copies of those communications are enclosed.

Please associate this material with the record in this proceeding on behalf of Paging Network, Inc.

Sincerely,


John W. Hunter

JWH:cpa
Enclosure

cc: Evan Kwerel, Office of Plans & Policy

No. of Copies rec'd 0+1
List ABCDE

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Department of Economics, College Park, MD 20742-7211

Peter Cramton

Associate Professor of Economics

office (301) 405-6987 fax 405-3542 home 699-1015 home fax 864-1840 email cramton@econ.umd.edu

18 July 1994

To:

Ms. Judith St. Ledger-Roty

*****Urgent*****

Mr. John Hunter

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Total Number of Pages: 6

From:

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Comments:

Here is everything for filing:

1. Email among auction experts and Evan Kwerel about the method for adjusting the bid increment.
2. "Further Comments on Adjusting the Bid Increment," a short note that Evan wanted.
3. "Basic Principles of Bid Increment Adjustment," a slide on the method that Evan requested.

Please file today if possible and send one copy to Evan Kwerel.

Evan is in the process of convincing others at the FCC (e.g. Don Gips) that this is a good idea. There is consensus among the auction experts and the FCC's panel (John McMillan, Charlie Plott, and Larry Latham) that the method is sound and should be implemented.

Sincerely yours,

Peter Cramton

RECEIVED

JUL 18 1994

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

To: EKWEREL @ SMTP (EKWEREL) {EKWEREL@fcc.gov}

Cc: cramton @ econ

From: John McMillan

Subject: bid increments

Date: 7/15/94 Time: 4:19p

Evan:

There seems to be consensus that Cramton's bid increment scheme is a good idea. I can see no problem with it, and Preston and Bob Wilson like it. Peter has performed a very useful service. The fact that he has run simulations is important—he is the only person who has a serious empirical feel for this issue.

The one potential problem is the scheme's complexity or, more accurately, apparent complexity. I can't judge how people will perceive it. Does this seem to you to be a problem?

My initial response was that 16 percent was too big a starting increment, but I now don't think that to be the case, given the low initial prices.

The decreasing increments incorporate the idea Preston put forward in November as an alternative to the Milgrom-Wilson activity rule. Having both would seem to be a good thing, in pushing the action along, provided it doesn't make the auction look too complicated. Does it?

The problem Preston raised—of small bidders who want only one license being locked out by large increments—doesn't seem all that important. Any inefficiencies generated that way would be small.

Is the Cramton scheme implementable as it stands? As far as I can see it covers everything for the narrowband auction. We can talk about it on the phone any time convenient for you.

John

John McMillan

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fax: 619 942 2643

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To: JMcMilla.SMTP @ SMTP (John McMillan) {jmcmillan@ucsd.edu}

Cc: "Kwerel, Evan", "McAfee, Preston", "Milgrom, Paul", "Plott, Charlie", "Wilson, Bob"

From: Cramton, Peter

Subject: Re: bid increments

Date: 7/16/94 Time: 5:56p

Originated by: JMcMilla.SMTP @ SMTP (John McMillan) {jmcmillan@ucsd.edu} 7/15/94 4:19p

Replied by: CRAMTON 7/16/94 5:56p

I have a few minor comments on John's comments about my proposal for adjusting the bid increments.

1. Apparent complexity. I view the proposed method as the simplest possible that satisfies the three principles: (1) start large, (2) end small, and (3) avoid large drops in the increment. It is a linear rule with an upper and lower bound. In addition to the computer simulations, I have conducted mock auctions on two occasions with actual narrowband bidders (top executives at PageNet). The executives easily and quickly understood the method for adjusting the bid increment, and its rationale. Only a few minutes of verbal explanation was needed. They found the rule to be natural and intuitive.

From a bidder's perspective, the current procedure (an increment of the greater of 5% or \$.01 per MHz-pop) is much more complex than the proposed method. Under the current rule, the bidder has to guess whether the FCC will take action to reach closure and if so

what action will be taken. If the bidder does not believe the FCC will take the proper action, then the bidder must devise strategies for accelerating the auction. Unfortunately, these individual strategies are likely to be ineffective for reasons described in my note.

2. Simulations. I agree with John that simulations are important. The only way to calibrate the increment parameters so that closure is reached in 20 to 60 rounds is to conduct detailed simulations of the auction. My confidence in the computer simulations has been enhanced by the fact that similar results were achieved with real bidders. (To be more precise, the mock auctions involved five real bidders and fifteen computer simulated bidders.)

--Peter

To: Cramton @ econ, EKwerel @ SMTP (EKwerel) {EKwerel@fcc.gov}, McAfee @ SMTP (McAfee) {McAfee@undo.eco.utexas.edu}

Cc: fMilgrom @ SMTP (fMilgrom) {fMilgrom@GSB-YEN.STANFORD.EDU}

From: Robert Wilson

Subject: Cramton's proposed narrowband a

Date: 7/11/94 Time: 6:04p

My interpretation of Preston's comment in the context of the narrowband auction is that a tapered bid-increment runs the following risk of interaction with the activity rule and the reservation price:

The reservation price and/or bid increment are so large early on as to preclude a firm from bidding on the only license (and all its close substitutes) it is interested in, so after its waivers are exhausted it must drop out of the auction, even though later there might be a smaller bid increment (due to the tapering) that in fact it would have been willing to offer had it been allowed to remain in the auction. Thus, efficiency is impaired if this firm is in fact the highest valuer of that license.

I take it that y'all consider this prospect to have negligible probability of occurring in the narrowband auction, especially for the national licenses, but that it might be sufficiently likely in the broadband auction to require remedial measures (of the sort discussed by Cramton and McAfee), especially for the BTA licenses in low-density areas. It seems to me that this problem hinges on the role of reservation prices, and unfortunately I do not know what the FCC policy is on this -- will there be substantial reservation in any of the auctions? To whatever extent the reservations prices are substantial, one must curtail the slope of the tapering of the bid increment so that it is not too high initially, or at least it is bounded above as well as below for low-value or low-density licenses.

To: RWilson.SMTP @ SMTP (Robert Wilson) {FWILSON@GSB-YEN.STANFORD.EDU}

Cc: "Kwerel, Evan", "McAfee, Preston", "McMillan, John", "Milgrom, Paul"

From: Cramton, Peter

Subject: Re: Cramton's proposed narrowba

Date: 7/16/94 Time: 5:59p

Originated by: RWilson.SMTP @ SMTP (Robert Wilson)

{FWILSON@GSB-YEN.STANFORD.EDU} 7/11/94 6:04p

Replied by: CRAMTON

7/16/94 5:59p

Bob:

Your interpretation of Preston's comment on a tapered bid increment is correct. For licenses of low value per MHz-pop, setting a large initial bid increment may prevent the high valuer from bidding on a license if the bidder is unable to maintain activity until bid increments have dropped. This is not an issue for the first two auctions (nationwide and regional). It may be an issue for MTA and BTA auctions. Fortunately, the FCC has decided not to set significant reserve prices in any of the auctions. The tentative reserve price is \$.02 per MHz-pop. Under my plan the reserve would be \$.064 per MHz-pop (the initial bid increment), but this would fall with bid activity.

Perhaps the simplest solution to Preston's problem is to use a much smaller bid increment (or no increment) in the initial round. For example, the bid increment in the initial round could be \$.01 per MHz-pop, and then immediately jump to the tapered increment (the greater of \$.064 per MHz-pop or 16% if there is sufficient bid activity). For licenses in which \$.064 per MHz-pop is too high, the first round essentially becomes a single sealed bid auction. The bidder interested in a single low-value license is able to express its value in the first round of bidding as in a sealed bid auction. Any inefficiency caused by this sealed bid feature of the first round would be small. It is isolated to a few low value licenses that do not exhibit any value interactions across other licenses. Indeed, there is no reason to suppose that a single sealed bid on such licenses would result in an inefficient allocation.

To address Preston's problem, I recommend that the initial round of all auctions have a minimum initial bid of zero. The bid increment in all subsequent rounds would be based on the tapered bid increment rule (a linear rule with an upper and lower bound) based on bidder activity on all licenses.

The advantage of this solution is that it solves the problem without introducing any extra complexity. Since Preston's problem would only apply to a small fraction of the least valuable licenses, it would not make sense to introduce a complex solution that has the potential for creating inefficiencies over a broader set of licenses. Moreover, this solution is consistent with the consensus view among auction experts and industry commentators that the FCC should not set reserve prices (see Second Report and Order at 206-207). It would permit the sale of low value licenses, such as the American Samoa MTA.

--Peter

P.S. I have been told that all these comments on the rules should be filed as ex parte communication if the comments are sent to someone at the FCC (e.g. Evan Kwerel), even if they are submitted as a "private citizen." This will assure that the development of the auction procedures will be an open process in which all bidders and citizens can benefit from the discussion. To help in this matter, I will have Reed Smith Shaw and McClay file this email on the auction rules as an ex parte communication. Please let me know if you wish to file your email separately. If I do not hear otherwise, all the email will be filed on Monday, July 18.

Further Comments on Adjusting the Bid Increment

Peter Cramton, 18 July 1994

I have conducted thousands of computer simulations of the nationwide auction using various methods for adjusting the bid increment and a wide set of valuation parameters. I have also conducted a handful of simulations with real bidders. The method that I proposed in the 9 July 1994 note, "Adjusting the Bid Increment in the Nationwide Narrowband PCS Auction," was based on this extensive analysis. Under my proposed rule, in only 11 cases out of 1185 (0.9%) were more than 60 rounds needed. The mean number of rounds was 41 with a standard deviation of 7. In contrast, using a method very similar to the FCC's proposal (5% or \$.01 per MHz-pop), in 1,284 cases out of 1,315 (97.6%) more than 60 rounds were needed. The mean number of rounds was 91 with a standard deviation of 15.

In my testing of the method using both computer and live simulations, there has never been a tendency for the bid increment to fluctuate in any significant way. In nearly all the simulations, the bid increment steadily declines without ever increasing by more than 1%. In some simulations, there was a small increase in the increment when stage 2 was reached. This was a result of some bidders increasing their bid activity in response to the more stringent activity rules in stage 2. I view such an increase as a virtue of the method. The increase may be just what is needed to reach a timely closure in the presence of insincere bidding in stage 1.

Although it is theoretically possible for the bid increment to oscillate under the proposed method, based on the simulations I view oscillation as a remote possibility. It would happen only if the market demand for licenses was nearly flat at the market clearing price. With 29 bidders and a great deal of uncertainty, it is almost inconceivable that the market demand would be flat at the market clearing price. However, should oscillation prove to be a problem, the FCC has wisely established a panel of experts to resolve the problem during the auction.

Basic Principles of Bid Increment Adjustment

- Start large.
- End small.
- Reduce increment as bidding activity falls.
- Avoid large drops in bid increment.
- Adopt and announce a plan for bid increment adjustment.

A Simple Method for Adjusting the Bid Increment

- Bidding activity is measured as # of new bids on all licenses in prior round.
- If # of new bids is ≥ 32 , then increment is greater of 16% of prior high bid or \$.064 per MHz-pop.
- If # of new bids is ≤ 8 , then increment is greater of 4% of prior high bid or \$.016 per MHz-pop.
- As # of new bids falls from 32 to 8, increment drops by $\frac{1}{2}\%$ (or \$.002 per MHz-pop) with each fewer new bid.
- Hence, if N = # of new bids in prior round, then for N between 8 and 32 bid increment is greater of:
 - $\frac{1}{2} \times N\%$ of prior high bid, or
 - $$.002 \times N$ per MHz-pop.
- Method accomplishes all five principles of bid increment adjustment.
- Based on thousands of simulations, closure is reached within 60 rounds provided move into stage 2 after 15 rounds to prevent insincere bidding.